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REMARKS

Undersigned attorney for applicant wishes to express his appreciation to the Examiner for carefully reviewing, revising and withdrawing the Official Action of July 3, 2002. In response to the corrected Action mailed May 30, 2003, applicant respectfully traverses the rejections set forth therein, for the following reasons.

The Invention

As noted at page 2, lines 12-16 of the present application, applicant has recognized the desirability and necessity of maintaining a radial clearance in a bearing at an optimum value, and has further recognized (e.g., page 3, lines 1-15) that such a clearance varies with temperature in accordance with particular relationships among device dimensions. As described at lines 5-13 of page 4, it is thus an object of the invention to maintain an optimal radial clearance even if component dimensions expand upon temperature increases.

In order to achieve this objective, applicant has described bearing structures wherein, as recited in each of the independent claims 1-5, there is provided a "low expansion member press fit around the outer periphery of the outer ring" (claim 1, lines 6-7; claim 2, lines 7-8; claim 3, lines 14-15; claim 4, lines 7-8 and claim 5, lines 14-15). The "low expansion member" of claims 3 and 5 is more particularly recited therein as a "low expansion ring".

Moreover, each independent claim explicitly recites the "low expansion member (or ring)" as being made of a material having a *coefficient of linear expansion* which is *lower than the coefficient* of linear expansion of the material *of the outer ring* over

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which it is press fit (claims 1-2 – last two lines; claims 3 and 5 – lines 16-17; and claim 4 – lines 9-10).

This aspect of the invention may be appreciated from the illustrative embodiment illustrated in applicant's Fig. 3, for example, wherein is provided a sleeve outer ring 17 and a low expansion sleeve 22. As described in the sentence bridging pages 15-16 of the application, the sleeve 22 is made of a material of lower coefficient of linear expansion than the material employed for the sleeve outer ring 17. Moreover, sleeve 22 is press fit around the outer periphery of the sleeve outer ring 17.

Applicant has determined that, by providing such an arrangement, the radial clearance of the bearing device can be maintained at an appropriate value, even if the temperature of the bearing device varies.

The Rejections

In rejecting each of the independent claims, and claims dependent therefrom, the Examiner applies either applicant's prior art (APA) or Itsu '571, together with Takemura et al. '545 and Pujari et al. '894, alone or with Miyazaki et al. '291.

In rejecting claim 1 which, incidentally, does *not* recite a "ring", the Action admits that APA "does not show a low expansion *ring* that is on the outer periphery of the outer rings and made of a material having a coefficient of linear expansion and the ball bearings made of a ceramic material". This assertion is made with respect to claim 1 at par. 4, last 3 lines.

When considering claims 2 and 4, which also do *not* recite a "ring", the Action states at the last 3 lines of pars. 10 and 23 that Itsu '521 "does not disclose a low

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expansion ring member pressed fitted on the outer periphery of the outer ring and made of material having a coefficient of linear expansion and the ball bearing made of a ceramic material”.

When considering claims 3 and 5 which *do* recite a “ring”, the Action states at the last 3 lines of pars. 16 and 29 that Itsu ‘521 “does not disclose a low expansion ring member pressed fitted on the outer periphery of the outer ring and made of material having a coefficient of linear expansion and the ball bearing made of a ceramic material”.

Irrespective of the erroneous reference to “ring” in rejecting claims 1, 2 and 4, which the Examiner is requested to correct during any further prosecution, the following deficiency is noted in each of the above rejections.

In order to support the rejection, the Action then relies on the Takemura et al. ‘545 reference (and not on any other teaching) for curing the above noted deficiencies in the primary references, as follows:

At each of paragraphs 5, 11, 18, 24 and 31, the Action asserts that “Takemura et al. illustrates in Figure 16 a *low expansion* member (bearing cylindrical ring) (303) which is press fitted around the outer periphery of the outer rings (304 and 305) in order to seal the motor” [emphasis added].

Traverse

Applicant courteously submits that, in the first place, *Takemura et al. fails to make any such disclosure.*

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Moreover, the *Action fails to address* applicant's recitation that the *low expansion member has a lower coefficient of linear expansion than the ring(s)*.

Accordingly, the Action also fails to *provide any prior art support* for its conclusion of obviousness of applicant's claims, each of which includes a requirement that the *low expansion member has a lower coefficient of linear expansion than the ring(s)*.

1. No Teaching of "Low Expansion Member"

As noted above each of applicant's claims require a member having a low expansion characteristic. However, upon thoroughly studying the specification of the Takemura '545 reference, and particularly the portions relating to description of Fig. 16, no teaching has been found that "a *low expansion* member (bearing cylindrical ring) (303)" is shown in Figure 16 as asserted in the Action.

Indeed, it is respectfully submitted that element 303 of Takemura et al. is simply disclosed as being a "Bearing Cylindrical Section", without any reference to its coefficient of linear expansion, and without any teaching or suggestion that such an undisclosed coefficient should be lower than the coefficient of linear expansion of the outer ring member of bearings 304-305.

Applicant provides herewith marked copies of Fig.16 and related Fig. 17, identifying the components thereof as disclosed in the '545 specification. No reference to expansion coefficient is shown, as none is made in the specification, either for bearing cylindrical section 303 or for any other component.

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Nor, for that matter, does the specification provide any disclosure, or use, of terminology such as a "coefficient of linear expansion". Indeed, throughout the specification, the only use of the term "low" or "lower" is found to describe a position, but not a value comparison of a physical characteristic.

The Examiner is courteously requested to identify any terminology on which reliance is had to conclude that the reference teaches "a low expansion member" as asserted.

Applicant respectfully submits that the '545 reference applied in the Action, which is purported to disclose this feature is, in fact, devoid of any teaching of the same.

Therefore, it is submitted that the Action has simply assumed, without any supporting disclosure in the referenced '545 patent, that the bearing cylindrical section illustrated therein is inherently and necessarily of lower expansion coefficient than the outer ring associated therewith.

In other words, the Action has concluded that the subject matter of each of applicant's claims would have been obvious, without identifying any basis for the conclusion of obviousness. As such, the Action fails to make a prima facie showing of obviousness under 35 USC 103 by failing to identify support in the prior art for the assertion that the subject matter of applicant's claims would have been obvious to one of ordinary skill in the art at the time the invention was made.

2. No Teaching of Relation of Linear Coefficient

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As hereinabove noted, the '545 reference fails to use any terminology of "low expansion coefficient", much less to provide a teaching that the coefficient of linear expansion of the material of one element should be lower than the coefficient of the material of another element, particularly the ring around which the low expansion member is press fit.

Without identification of any reference to the coefficient of linear expansion of the expansion member, and without identification of any prior art teaching or suggestion that such an undisclosed coefficient should be lower than the coefficient of linear expansion of the outer ring member of bearings 304-305 of the '545 reference, it is again submitted that the Action has failed to make a *prima facie* showing of obviousness of claims, each of which requires both features.

Accordingly, withdrawal and reconsideration of the rejection is in order and the same is courteously solicited.

3. Additional Deficiencies of the Prior Art

Rather than a member which is press fit over a ring, it is believed clear that bearing cylindrical section 303 *can not* be press fitted on rings 304-305.

In fact, applicant respectfully submits that cylindrical ring 303 is used for retaining the two outer rings 304 and 305 in the *axial* direction. The presence of oppositely directed radial shoulders on bearing cylindrical section 303 is believed to make impossible any press fitting around the outer rings.

Indeed, applicant further notes that the thermal expansion of the section 303 prevents maintenance of an adequate pre-load in the structure.

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In summary, it is respectfully submitted that neither the Pujari et al. '894 nor the Itsu et al. '571 reference discloses any feature which would have made obvious the above noted aspect of applicant's invention, relating to a structure enabling maintaining the radial clearance of the bearing device at an appropriate value, even if the bearing device temperature is varied.

However, the reference relied upon in the Action for curing this deficiency of the prior art fails to do so for the reasons noted above.

It is accordingly submitted that, irrespective of any other distinctions between the present claims and the applied art, the above noted failure clearly demonstrates lack of support for the rejections set forth in the outstanding official action and requires reconsideration and withdrawal of the rejection of applicant's claims under 35 USC 103.

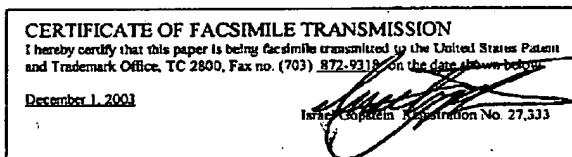
In order to clarify further an advantage arising from the recited structure, new claims 16-20 are added herein. The newly added claims identify the low expansion member (or low expansion ring) as being arranged for maintaining a radial clearance of the bearing device at a predetermined value under a varying temperature condition.

As the new claims depend from the five independent claims hereinabove discussed, it is respectfully submitted that similarly to the independent claims, the new claims are also patentably distinguished from the art previously applied. Such distinction arises both because of dependence on the independent claims and in view of the specific recitations provided therein, inasmuch as the applied art fails to provide any

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structure for maintaining radial clearances at predetermined values under varying temperature conditions.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance over the art of record and an early indication of the same is courteously solicited. In order to expedite resolution of any remaining issues and further to expedite passage of the application to issue, the Examiner is respectfully requested to contact the undersigned by telephone at the below listed local telephone number if any further comments, questions or suggestions arise in connection with the application.



Respectfully submitted,

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Date: December 1, 2003